

CLAIMS

1 1. In a data link switching (DLSw) network, a method for improving interaction between
2 a first remote DLSw device coupled to a remote subnetwork including a switch having a
3 forwarding table and a local DLSw device coupled to a local subnetwork including local
4 end stations, the local DLSw device establishing a first logical peer connection with the
5 first remote DLSw device in response to a failure of a second remote DLSw device, the
6 method comprising the steps of:
7 at the first remote DLSw device, using configuration information to determine the
8 local end stations that are reachable through the first logical DLSw peer connection;
9 generating one or more test frames at the first remote DLSw device, the test
10 frames having source addresses comprising addresses of the reachable local end stations;
11 forwarding the test frames through the switch to force the switch to immediately
12 update the forwarding table with (i) a port identifier (ID) of a port receiving the test
13 frames at the switch and (ii) the source addresses of those frames.

1 2. The method of Claim 1 wherein destination addresses of the frames are
2 group/multicast addresses and wherein the source and destination addresses are medium
3 access control (MAC) addresses.

1 3. The method of Claim 2 wherein the test frames are Logical Link Control Type 1
2 (LLC1) TEST frames.

1 4. The method of Claim 3 wherein the switch is an Ethernet switch.

1 5. The method of Claim 4 wherein the step of using configuration information comprises
2 the step of learning the MAC addresses of the reachable local end stations via a MAC ad-
3 dress list control vector of a DLSw Capabilities Exchange message transmitted by the
4 local DLSw device.

1 6. The method of Claim 4 wherein the step of using configuration information comprises
2 the steps of:
3 scanning a list of statically-configured MAC addresses located within a configu-
4 ration file of the first remote DLSw device; and
5 determining whether a MAC address corresponds to the port ID of the local
6 DLSw device.

1 7. The method of Claim 5 further comprising the steps of:
2 at the local DLSw device, monitoring the second remote DLSw device to deter-
3 mine when it becomes operational;
4 establishing a second logical connection between the local DLSw device and the
5 second remote DLSw device when the second remote DLSw device becomes operational;
6 destroying the first logical connection between the local DLSw device and the
7 first remote DLSw device.

1 8. The method of Claim 7 further comprising the steps of:
2 issuing the DLSw Capabilities Exchange message including the MAC address list
3 control vector from the local DLSw device over the second logical connection to the sec-
4 ond remote DLSw device;
5 creating, at the second remote DLSw device, the LLC1 TEST frames using the
6 MAC addresses from the control vector as source MAC addresses of the frames;
7 sending the LLC1 TEST frames from the second remote device through an incom-
8 ing port of the Ethernet switch; and
9 recording the source MAC addresses of the frame and a port ID of the incoming
10 port in the forwarding table, thereby forcing the Ethernet switch to update the forwarding
11 table.

1 9. In a data link switching (DLSw) network, apparatus for improving interaction between
2 a first remote DLSw device coupled to a remote subnetwork including remote end sta-
3 tions and a local DLSw device coupled to a local subnetwork including local end stations,
4 the local DLSw device establishing a first logical peer connection with the first remote
5 DLSw device in response to a failure of a second remote DLSw device, the apparatus
6 comprising:

7 a switch having a plurality of ports coupled to the remote DLSw devices and the
8 remote end stations, the switch including a forwarding table for storing addresses of the
9 local and remote end stations accessible through the ports;

10 a configuration data structure stored at the first remote DLSw device, the configu-
11 ration data structure used to determine the local end stations that are reachable through
12 the first logical DLSw peer connection;

13 at least one test frame structure generated by the first remote DLSw device, the
14 test frame structure having a source address comprising an address of a reachable local
15 end station; and

16 means for forwarding the test frame structure from the first remote DLSw device
17 and through the switch to force the switch to immediately update the forwarding table
18 with (i) a port identifier (ID) of a port receiving the test frame structure at the switch and
19 (ii) the source address of the test frame structure.

1 10. The apparatus of Claim 9 wherein the switch is an Ethernet switch.

1 11. The apparatus of Claim 10 wherein a destination address of the test frame structure is
2 a group/multicast address, and wherein the source and destination addresses are medium
3 access control (MAC) addresses.

1 12. The apparatus of Claim 11 wherein the test frame structure is a Logical Link Control
2 Type 1 (LLC1) TEST frame.

- 1 13. The apparatus of Claim 12 wherein the configuration data structure is a MAC address
- 2 list control vector of a DLSw Capabilities Exchange message transmitted by the local
- 3 DLSw device.

- 1 14. The apparatus of Claim 12 wherein the configuration data structure is a configuration
- 2 file containing a list of statically-configured MAC addresses.

- 1 15. The apparatus of Claim 13 wherein the first remote DLSw device is a backup remote
- 2 DLSw device and wherein the second remote DLSw device is a primary remote DLSw
- 3 device.

- 1 16. The apparatus of Claim 13 wherein the first remote DLSw device is a primary remote
- 2 DLSw device and wherein the second remote DLSw device is a backup remote DLSw
- 3 device.